



## White-nose Syndrome: Guidelines for Bat Carers

### What is White-nose syndrome?

White-nose syndrome (WNS) is the name used to describe a group of symptoms associated with the deaths of over one million bats since 2006 across the Eastern USA (19 states) and Canada (four provinces)<sup>1</sup>. These symptoms are:

- bats with a white fungus (*Geomyces destructans*), particularly around the nose, but also on the wings, ears and/or tail (see photos in Appendix I);
- bats clustered near the entrance of hibernacula, or in areas not normally identified as winter roost sites;
- bats flying outside during the day in temperatures at or below freezing; and/or
- dead or dying bats in or near hibernation sites.

In isolation, the symptoms do not necessarily indicate WNS; for example bats with a white fungus might otherwise be perfectly healthy. Conversely, not all bats affected with WNS will necessarily be found with white fungus on them.

### What causes WNS?

The fungus, *G. destructans*, has been confirmed as the cause of WNS<sup>2</sup>. It is a soil fungus that grows optimally at the temperatures found in winter hibernacula, which irritates the bats and causes energetically-expensive arousals from hibernation, loss of body fat and starvation. Recent research has also suggested that infections on the wing membranes of bats may lead to dehydration thereby increasing the frequency of arousals<sup>3</sup>. Additionally where the fungus causes lesions in the wing membrane, this may affect the fitness of bats that survive the hibernation period.

### Have there been any cases of WNS in the UK or Europe?

The fungus *G. destructans* has been positively identified in bats in eight European countries including France, Germany, Switzerland and several countries in Eastern Europe (the first confirmed finding was in 2009) and

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<sup>1</sup> Turner, G., Reeder, D.M. and Coleman, J.T.H. (2011) A Five-Year Assessment of Mortality and Geographic Spread of White-nose Syndrome in North American Bats and a Look to the Future. *Bat Research News* 52(2): 13-27

<sup>2</sup> Lorch, J. M. et al. (2011) Experimental infection of bats with *Geomyces destructans* causes white-nose syndrome. *Nature* doi:10.1038/nature10590

<sup>3</sup> Willis, C.K.R., et al. (2011) Evaporative Water Loss Is a Plausible Explanation for Mortality of Bats from White-Nose Syndrome. *Integrative and Comparative Biology* 51(3): 364-373

there is photographic evidence from a further four countries<sup>4</sup>. However, this is the only 'symptom' identified in Europe; there have been no reports of mass die offs. Therefore there is no evidence of the syndrome itself.

There have been no confirmed cases of WNS and *G. destructans* has not been found in the UK.

### **One of my bats has white fungus around its nose, wings, ears and/or tail. What should I do?**

1. Ensure that the bat is isolated from all other bats in your care\*
2. Any equipment used for this individual (e.g. gloves, food and water containers) should also be kept separate and used for this individual only.
3. All equipment should be sterilised when no longer in use. Decontamination advice given in Appendix III should be followed.
4. Take a photo of the affected bat(s).
5. Complete the form in Appendix II
6. Wearing single-use gloves, take a sample of the external fungus by making a loop with a strip of tape (adhesive side turned outside), then carefully approach the fungal lesion, letting superficial fungal structures adhere. Press your adhesive tape onto a transparent piece of plastic, for example, a food storage bag, making sure there are no air bubbles or gaps between the spore sample and plastic.
7. Carefully package the sample and post to the VLA (see contact information below); and contact BCT immediately to report the sighting.

If the bat is dead on arrival, or needs to be euthanized for welfare reasons, the entire body can be sent off for testing rather than following the sample procedure above.

All fungal samples should be sent chilled/frozen to:

A M Barlow MRCVS  
AHVLA Langford  
Langford House,  
Langford  
Somerset  
BS40 5DX

The appropriate package should be clearly marked with "Suspected White-nose syndrome", and also "Pathological specimen. Handle with care". Please telephone or email Alex Barlow first if possible on 01934 852421 or [a.barlow@vla.defra.gsi.gov.uk](mailto:a.barlow@vla.defra.gsi.gov.uk).





\* Please note that all bats suitable for eventual release should be kept isolated from other individuals.

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<sup>4</sup> Puechmaille, S.J., et al. (2011) Pan-European Distribution of White-Nose Syndrome Fungus (*Geomyces destructans*) Not Associated with Mass Mortality. PLoS One 6(4) e19167

## Appendices

### Appendix I: Photo examples of WNS from the US

	<p><a href="http://www.fws.gov/northeast/whitenose/images/MYLU_BreathingCave2_0209.jpg">www.fws.gov/northeast/whitenose/images/MYLU_BreathingCave2_0209.jpg</a> Likely WNS symptoms at Breathing Cave, Bath County, Virginia, late February 2009 Photo courtesy of Wil Orndorff, Virginia Department of Conservation and Recreation - Division of Natural Heritage</p>
	<p><a href="http://www.fws.gov/northeast/whitenose/images/3841fungusondorsal.jpg">www.fws.gov/northeast/whitenose/images/3841fungusondorsal.jpg</a> Little brown bat; fungus on dorsal surface of wing and tail membranes, Oct. 2008, New York Photo courtesy of Ryan von Linden/New York Department of Environmental Conservation</p>
	<p><a href="http://www.fws.gov/northeast/whitenose/images/3842close-upofnosewithfungus.jpg">www.fws.gov/northeast/whitenose/images/3842close-upofnosewithfungus.jpg</a> Little brown bat; close-up of nose with fungus, New York, Oct. 2008. Photo courtesy of Ryan von Linden/New York Department of Environmental Conservation</p>
	<p><a href="http://www.fws.gov/northeast/whitenose/images/3844Fungusonwingandtailmembrane.jpg">www.fws.gov/northeast/whitenose/images/3844Fungusonwingandtailmembrane.jpg</a> Little brown bat; Fungus on wing and tail membrane, Oct. 2008, New York Photo courtesy of Ryan von Linden/New York Department of Environmental Conservation</p>



[www.fws.gov/northeast/whitenose/images/fungus\\_arm\\_and\\_lesion\\_crop.jpg](http://www.fws.gov/northeast/whitenose/images/fungus_arm_and_lesion_crop.jpg)

Possible sign of fungal irritation on arm, Barton Cave, Pa.  
Photo courtesy of Greg Turner, Pennsylvania Game Commission



[www.fws.gov/northeast/whitenose/images/Ear\\_fungus\\_Canoe\\_Creek\\_interior.jpg](http://www.fws.gov/northeast/whitenose/images/Ear_fungus_Canoe_Creek_interior.jpg)

Possible sign of fungal irritation on ear, Canoe Creek, Blair County, Pa.  
Photo courtesy of Greg Turner, Pennsylvania Game Commission



[www.fws.gov/northeast/whitenose/images/MLuciWhiteNose2428.jpg](http://www.fws.gov/northeast/whitenose/images/MLuciWhiteNose2428.jpg)

Little brown bat with white-nose syndrome, New York  
Photo courtesy of Al Hicks, New York Department of Environmental Conservation

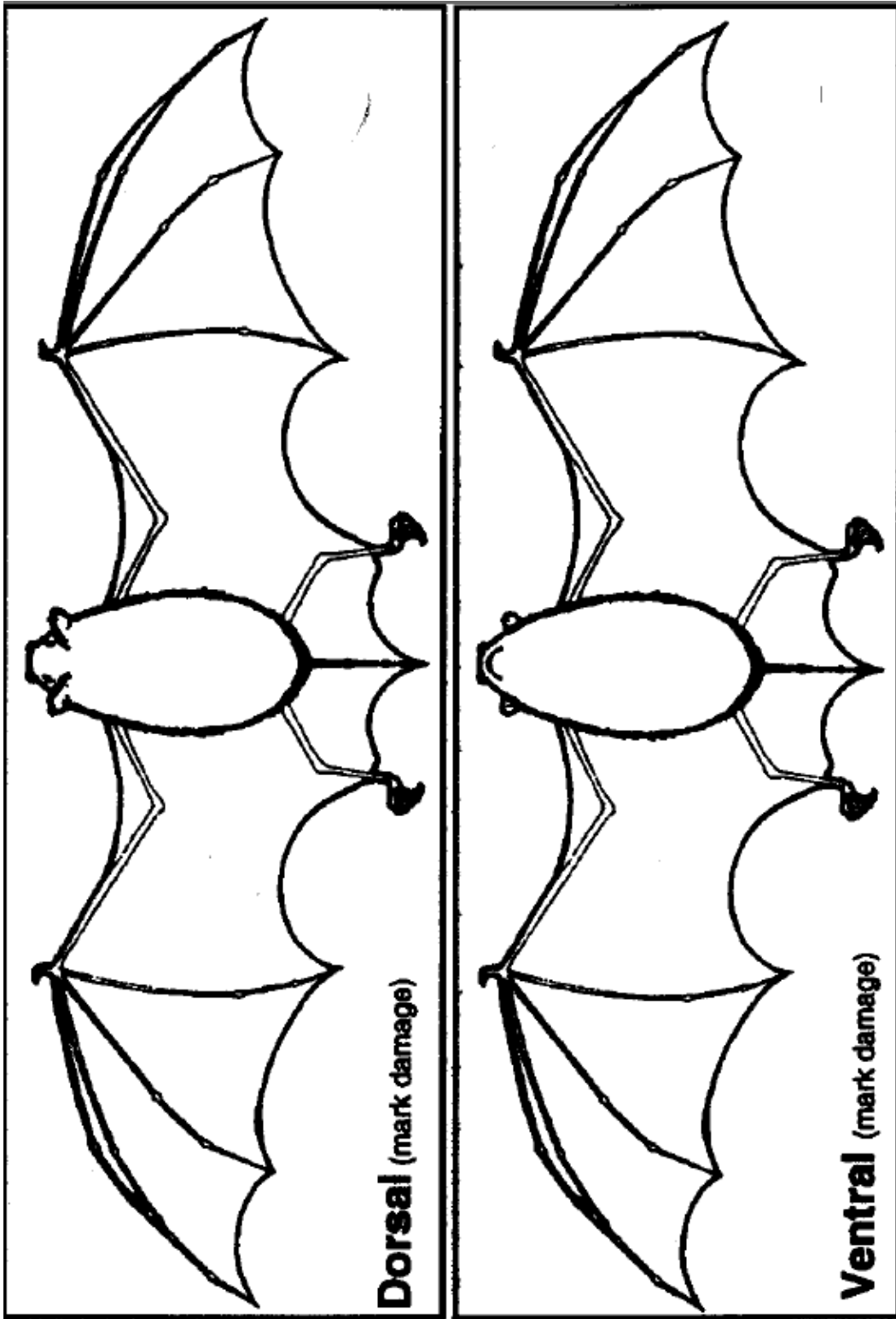
## Appendix II: Bat Carer Surveillance Form

If you observe any of the symptoms associated with WNS, please submit your observations online by going to [www.bats.org.uk/pages/report\\_form.html](http://www.bats.org.uk/pages/report_form.html) or call 0845 1300 228 during office hours (9.00-17.30 Monday-Friday).

<b>PART 1: Your Details</b>	
Name	
Address	
Postcode	
Daytime telephone	
Email	
<b>PART 2: Details of the site at which the bat was found (if known)</b>	
Site name	
Site location (including county)	
Grid reference	
Date found	
Name and contact details of finder	
<b>PART 3: Observations in relation to suspect fungus</b>	
Bat species	
Age (juvenile / adult)	
Sex	
Body weight (grams)	
Body condition (very good / good / moderate / bad / emaciated)	
Colour of fungus	
Number of fungal patches	
Size of fungal patches (min and max, in mm)	
Sample taken?*	
Photograph(s) taken?	

**\*Sampling method** (based on the protocol developed by Leibniz Institute for Zoo and Wildlife Research)  
Wearing single-use gloves, gently touch the visible fungal lesion with the adhesive tape, letting only the superficial fungal structures adhere. Try to avoid getting soil or other matter mixed in with the sample. Gently, press your adhesive tape onto a transparent piece of plastic, for example a food storage bag, making sure there are no air bubbles or gaps between the spore sample and plastic. Taking care not to squash it, store the sample until it can be securely packaged between two bits of card and posted to the AHVLA along with the dead bat.

Localisation of fungal infection(s) (please mark in the sketch)



Please return this page to the AHVLA with the fungal sample

### **Appendix III: Recommended decontamination procedure for bat carers handling bats with suspect fungus**

The recommendations below are targeted at UK bat carers who have identified a suspect fungus on live or dead bats and who are likely to come into contact with other bats during roost visits or education work.

#### **Quarantine**

- If you have more than one bat in care, the suspect bat should be kept in a separate room until the VLA result has been confirmed.
- All equipment used for this bat should be kept separate and only used for this individual.

#### **If you handle a suspect bat please:**

- Use a pair of disposable gloves to handle the bat or, alternately, keep one pair of gloves in the room with the suspect bat for re-use. Wash these with the hottest cycle possible for the material, using conventional detergents before use elsewhere.
- Clothing – Ark-KLens is a powerful disinfectant that can be used to decontaminate boots and clothes. It is available online from [www.vetark.co.uk/pages/Ark-KLens\\_4.aspx](http://www.vetark.co.uk/pages/Ark-KLens_4.aspx) (the 'ready to use' product is £5.87; September 2011 price). For easy application, we suggest decanting 'ready to use' disinfectant into a trigger spray container, such as those available from hardware stores (check usage instructions on the product you have purchase), for example, [www.arco.co.uk/products/5634489](http://www.arco.co.uk/products/5634489) (cost £1.36 September 2011 price).
- Disinfect any hard equipment that has come into contact with the bat using  $\geq 0.3\%$  concentration of quaternary ammonium compounds such as Lysol® All-purpose Professional Cleaner, Lysol® disinfecting wipes or the antibacterial form of Formula 409®; or use sodium hypochlorite bleach (i.e. household bleach) solution diluted to 1 part bleach to 9 parts water. Keep on surface for 10 minutes, then rinse and air dry.
- Clean exposed skin (arms, face, neck, hands, etc.) with antibacterial hand sanitizer before leaving the room. The skin cleaner Hibiscrub is also a useful antifungal for use on hands. This is available from Boots [www.boots.com/en/Hibiscrub-Skin-Cleanser-250ml-1-bottle\\_872185/](http://www.boots.com/en/Hibiscrub-Skin-Cleanser-250ml-1-bottle_872185/) for £8.29 (September 2011 price). You can, alternatively, wash your hands thoroughly with soap and water.

Please note: antibacterial hand gels are not effective against fungal spores.